occultation of Antares 1819, April 13, when at emersion the star appeared to suddenly increase from one of the sixth or seventh magnitude to one of the first, a phenomenon no doubt attributable to the existence of the small companion on the parallel, preceding the principal star (NATURE, vol. xii. p. 308).—The next occultation of Atlas-Pleiadum, on February 3, will not be visible in this country, but may be well observed in the United States. The American Ephemeris gives the time of immersion for Washington; at the Observatory of Hamilton College, Clinton, N.Y., so actively conducted by Prof. Peters, the immersion takes place at 11h. 13m., and the emersion at 12h. 4m., Clinton M.T.

VARIABLE STARS.—In No. 2071 Dr. Julius Schmidt, of the Observatory, Athens, continues his elaborate researches on the three short-period variables U, W, and X Sagittarii, the periods of which are now given thus :—

	d.	h.	m.	s.
U Sagittarii	6	17	53	1·4
W = γ′ Sagittarii	7	14	15	34·1
X = 3 Flam.	7	0	17	42·5

So assiduously have these stars been watched by their discoverer, Dr. Schmidt, in the fine skies of his locality (little success could be expected to attend their observation in England), that he believes he has detected perturbations of the light curve or period in each instance, though not quite ten years' observations are yet upon record.

The following are Greenwich times of geocentric minima of Algol, according to Prof. Schönfeld's elements :—

	h.	m.		h.	m.
1876. Feb. 2	18	37	1876. Feb. 25	17	11
5	15	26	28	14	0
8	12	15	March 2	10	49
11	9	4	5	7	39
14	5	54			

Similar times of geocentric minima of S Cancri, according to Prof. Schönfeld, are :—

	h.	m.		h.	m.
1876. Jan. 29	13	46	1876. April 14	10	54
Feb. 17	13	2	May 3	10	12
March 7	12	19	22	9	31
26	11	36			

RECENTLY-DISCOVERED MINOR PLANETS.—No. 152, discovered at Paris by M. Paul Henry on Nov. 2, has been named *Atala*, and for No. 157, the small planet, detected by M. Borrelly at Marseilles on Dec. 1, the name of *Dejanira* is proposed; elements of this planet have been calculated by M. Stephan. The following are first approximations to the positions of the ascending node, inclination, and periods of the newer minors, with dates of discovery :—

No.	Ascending Node.	Inclination.	Period in years.	Date of discovery, 1875.
	° ′	° ′		
150	207 55	2 2	5·16	Oct. 18
151	40 2	7 52	4·15	Nov. 1
152 (Atala) ...	41 29	12 10	5·54	Nov. 2
153 (Hilda) ...	228 20	7 45	7·84	Nov. 2
154	37 35	20 49	5·78	Nov. 4
155	40 16	8 52	Circular elements	Nov. 8
156	246 11	7 29	5·29	Nov. 22
157 (Dejanira)	62 25	11 50	4·16	Dec. 1

[Since the above was in type No. 158 is announced in the *Berlin Circular* and Leverrier's *Bulletin International*, as having been discovered at the Observatory of Berlin, by Herr V. Knorre, on the morning of the 5th inst., in R.A. 7h. 19m. 58s., and N.P.D. 67° 58′. Magnitude 11-12.]

THE NEW MUSEUM OF THE GEOLOGICAL SOCIETY

WHEN it was first announced to the Council of the Geological Society that the Government proposed to offer a suite of rooms in Burlington House in lieu of the apartments the Society occupied in Somerset House, it was at once seen that the most formidable work the change involved would be the removal of the collections of minerals and fossils. The transference of the library, though an extensive one, would be a comparatively easy matter, but there is always the danger in the mere handling of fossils that they may be damaged. Besides this, the collection had gradually grown to such a size that it was evident the cost of the removal would be considerable. So far as the preparation of the rooms at Burlington House was concerned, the Government showed every desire to conform as far as possible to the wishes of the Council.

Some of the Fellows counselled that the whole collection should be offered to the British Museum or to the School of Mines Museum in Jermyn Street, on the ground that though in the early days of the Society it was of high value when it was the only museum that existed, it was now so far surpassed in magnitude by the national collections that it was practically of small value. Fortunately wiser counsels prevailed. There were in the museum, it was urged, many typical collections formed by the early leaders of geological science, which were bequeathed in illustration of papers they had read and work they had done. These collections, obtained by their own personal labour in the field, arranged and named in their own handwriting, were of historical value and had a European reputation, and ought to be religiously preserved by the Society. It was true that the integrity of some of the collections had been destroyed in the endeavour at one time to make one general collection illustrating the whole of England, and arranged in stratigraphical order; but in most cases the original labels and references to catalogues were preserved, and it was hoped it might be possible in the new buildings to regroup the specimens much as they were at first. It was therefore determined that the museum should be maintained, not as a general geological collection, but mainly as a repository of specimens referred to in papers, and that before the removal commenced it should be carefully weeded, so that in all cases where, through the accidental removal of a label or other causes, the history of any specimen had been lost, it should be discarded, but not until every effort had been made to try to ascertain any possible clue. This work has been carried out by Prof. Rupert Jones, aided by Mr. Woodward, the assistant curator. The accumulation of specimens had caused much crowding in the museum, and in such a case a certain amount of damage and loss of labels was almost inevitable. As a consequence of this weeding, many specimens have been omitted in the new arrangement, and the result has been to leave greater space for those that have a real historic value.

Like many other institutions of gradual growth, the history of this museum has never been written, and very few people, few even of the Fellows of the Society, know what it contains, for there never has been a printed catalogue. As the collections are the private property of the Society and are not open to the public, this perhaps has not been thought requisite.

Among the principal collections preserved which have now historic value, first in point of general interest should perhaps be mentioned the extensive series of fossils presented by Sir Roderick Murchison, from which were drawn the figures in his world-renowned "Siluria." The fossils figured in the papers by Murchison and Sedgwick in describing the structure of Wales and the Lake district are also there, so are the fossils that illustrated Murchison's description of Brora. The fossils connected with Webster's well-known paper of 1814, the first paper on the Tertiaries of Hampshire; most of those illustrating Fitton's celebrated paper on the "Strata below the Chalk" (1827); those belonging to Buckland and Conybeare's comprehensive paper "On the South-west of England" (1824) are all there. Large additions to the general col-

lection were also made by Dr. Mantell, Dr. Macculloch, and Mr. Leonard Horner.

It will be recollected that the Society was originated in 1807, at a time when mineralogy was a fashionable study, or at least when collections of minerals formed part of the "furniture" of the apartments of the Queen and many of the nobility. Collections of shells and of fossils were also fashionable, but they were valued only for their beauty or their rarity, and not for any knowledge of nature they afforded. For some time the young society seems to have followed fashion. Indeed, the value of fossil organic remains as giving a clue to the consecutive sequence and relative order of strata was then but just beginning to be understood. It was not till the end of 1799 that the first MS. table of the sequence from the Carboniferous beds upwards was constructed, and no map of the strata of England was published till 1815. The earliest MS. catalogue of specimens belonging to the Society, begun in 1808 or 1809, is labelled "General Catalogue of Minerals," and some of the early entries of organic fossils refer rather to the rock in which the fossil is imbedded; the presence of the fossil being but casually noticed, such as "limestone containing shells." These early collections of fossils illustrating the labours of the first geologists in using organic remains to trace the chronological sequence of beds, and to compile some chapters of the earth's history, have a profound interest, laying as they did the foundations of a science which has placed at rest many wild theories of the origin of the earth, and has, too, proved to be of such practical value. The first donation recorded is Feb. 5th, 1808, of specimens from St. Anthon's Colliery, Newcastle-upon-Tyne, by the Right Hon. Sir J. Banks. It would occupy too much space to mention all the collections that the Society has preserved, but among the donors are the well-known names of Sir Henry de la Beche, Sir Charles Lyell, Greenough, Warburton, and Sir Woodbine Parish. McEnery's collection that first brought Kent's Cavern into notice is there, and so is a splendid series of Daniel Sharpe's "Brachiopoda." The old red sandstone fishes presented by Lady Gordon Cumming are remarkable for their beauty as well as for the extent of the collection.

Many distinguished living geologists have private collections of their own; for example, the Earl of Enniskillen, Sir Philip Egerton, Prof. Prestwich, Mr. Searles Wood, Dr. Bowerbank, &c., which fully explains why their contributions are not so numerous as might be expected from the valuable work they have done. Prof. Phillips, though so energetic a worker, is not largely represented in the museum, for firstly York, and afterwards Oxford, had stronger claims on him. The same remark applies somewhat to the claims of the Woodwardian Museum on Prof. Sedgwick. As illustrating the geology of England generally, the Jermyn Street Museum and the British Museum are more useful, but as a record of early geological work the museum of the Society is unique.

The rearrangement of the foreign collections has not yet been completed, though it is in progress. Suites of specimens are to be seen there from all parts of the known world from which it has been possible for travellers to send them. These foreign collections are, to some extent, the result of contributions by officers in Her Majesty's services. Central Africa is not represented, but there are several collections from both coasts. For the future it is intended to add to the British collection only those specimens that are sent in illustration of papers read to the Society, but foreign specimens will be received as before.

Among the treasures of the museum, besides the rocks and fossils, there are the original drawings of Agassiz's "Poissons Fossiles," presented by the Earl of Enniskillen, the first manuscript geological map of England (1799), and the first table of strata, by W. Smith (1799).

The previous changes in the locality of the museum have been as follows:—In No. 4, Garden Court, Temple, the first fixed habitation of the Society (June 1809), the collection was commenced. In June 1810 it was removed to 3, Lincoln's Inn Fields; in June 1816 to 20, Bedford Street; in the autumn of 1828, to Somerset House; at Somerset House it has remained till this last move to Burlington House.

CONDENSED AIR TRAMWAYS

FOR some weeks the North Paris Tramways Company has been trying on the line from Courbevoie to the Arc de l'Etoile a new system of locomotion, in which the motive power is compressed air. Some details of M. Mékarski's (the inventor) system are given in the *Revue Scientifique*. It is capable of considerable developments and of varied applications, since it has solved in a very satisfactory manner the double problem of the industrial production of air condensed to very high pressures, and of the storage of the air in reservoirs intended to discharge into a cylinder placed in any apparatus whatever, at any distance from the condensing pump.

The "Voiture Automatique" of M. Mékarski is characterised by the absence of an imperial and by a platform in front and another behind. This car carries the reservoirs of condensed air, the apparatus for distribution, and the cylinders. M. Mékarski places under the truck of the car the sheet-iron cylinders, which contain the condensed air; on the front platform is placed the distributing apparatus which the engine-man works; the two cylinders are placed, as in certain locomotives, outside the framework, horizontally, and act directly, by means of a crank, on the front wheels of the car. No doubt this arrangement might be advantageously modified; but the important point is the possibility of manufacturing compressed air in sufficient quantities to be of use as a motive power.

The condensing apparatus used by M. Mékarski consists of two pump-barrels of cast-iron, placed vertically, communicating respectively with two horizontal pump-barrels, in which move two pistons worked by a steam-engine. This is, in reality, a double condensing pump, the former bringing the air to the pressure of from ten to twelve atmospheres, and the second raising the pressure to twenty-five atmospheres. The pistons act upon a mass of water which compresses the air directly and absorbs by degrees the heat disengaged by compression. By an ingenious contrivance the supply of water is continually renewed, and the temperature thus kept down. But this arrangement does not absorb a sufficient amount of the heat disengaged, a difficulty which M. Mékarski has met as follows. The external air drawn into the pump raises a valve constantly covered by a layer of water of several centimetres; besides, a large cast-iron tube, constantly traversed by the air already condensed and the excess of water, communicates with the two vertical pump-barrels; finally, the second pump is fitted with a tap by which the heated water escapes.

In M. Mékarski's automatic car the compressed air is stored, under the truck, in sheet-iron reservoirs or cylinders. The total capacity is about 2,000 litres; 1,500 litres serve as an ordinary supply; 300 litres constituting a reserve; the remaining 200 litres are intended to serve as a brake. The air is compressed in the cylinders to the pressure of twenty-five atmospheres. On the line from Courbevoie to the Arc de Triomphe, 7,500 metres going and returning, the resistance is unusually great. In one experiment the ordinary feeding cylinders contained 1,500 litres of twenty-five atmospheres at departure, and the pressure, on arrival, was not more than four and a quarter atmospheres. The expenditure had thus been about 1,250 litres at twenty-five atmospheres for a run of 7,500 metres, or 166 litres per kilometre.

But unless it is possible to heat the air gradually